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February 15, 2005

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APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A
FILING DATE.

APPLICATION NUMBER: 60/536,791

FILING DATE: *January 14, 2004*

RELATED PCT APPLICATION NUMBER: PCT/US05/01372



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for Intellectual Property
and Director of the United States
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17698 US PTO
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Express Mail No.: EV 381772615 US

IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE

Application Number:

Applicants:

Filed:

Title:

Donald H. Eason

January 14, 2004

Instrument Support Apparatus Having Non-Horizontal Tiers and
Vertical Axis Pivot Capability

Assignee:

Ultimate Support Systems, Inc.

Attorney Docket:

Ultimate-MDS-20-Prov

Customer No.:

33549

13441 U.S.PTO
60/536791



LETTER OF TRANSMITTAL

Mail Stop Provisional Application
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Dear Sir:

Enclosed for filing are:

1. an Application Data Sheet;
2. a Provisional Application Cover Sheet;
3. a Power of Attorney;
4. a Statement Establishing Small Entity Status (Small Business Concern) hereby claimed;
5. a Specification and Drawings;
6. Assignment of Patent Rights along with a Recordation Cover Sheet;
7. a list of references to be incorporated by reference in accordance with the provisional application and copies of those references;

8. this Letter of Transmittal along with a check made payable to the Director of the Patent and Trademark Office in the amount of \$120.00 (\$80.00 for the Provisional Filing Fee and \$40.00 for the Assignment Recordation Fee);
9. Certificates of Express Mailing for each document and a postcard receipt for return to the undersigned.

Please confirm receipt of the documents by applying your date stamp on the enclosed postcard receipt and returning it to me.

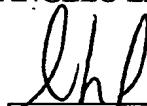
Please address all future correspondence to: Santangelo Law Offices, P.C., 125 South Howes, Third Floor, Fort Collins, CO 80521.

I have this 14th day of January 2004, either myself personally or through my direction of staff at this office, deposited all of the items in the above letter of transmittal with the United States Postal Service as Express Mail, postage prepaid, in an envelope addressed to: Mail Stop Provisional Application, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

Dated this 14th day of January 2004.

Respectfully Submitted,
SANTANGELO LAW OFFICES, P.C.

By:



Alfred K. Wiedmann Jr.
Attorney for Assignee
PTO No. 48,033
125 South Howes, Third Floor
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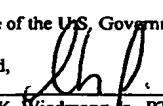
PROVISIONAL APPLICATION COVER SHEET

EFS Customer No. 33549			Docket Number: Ultimate-MDS-20-Prov		
INVENTOR(s)/APPLICANT(s)					
Last Name	First Name	Middle Initial	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY)		
Eason	Donald	H.	1909 N. County Road 11, Fort Collins, CO 80524 US		
TITLE OF THE INVENTION (280 characters max.)					
Instrument Support Apparatus Having Non-Horizontal Tiers and Vertical Axis Pivot Capability					
CORRESPONDENCE ADDRESS					
Alfred K. Wiedmann Jr. SANTANGELO LAW OFFICES, P.C. 125 South Howes, Third Floor Fort Collins, CO 80521					
STATE	CO	ZIP CODE	80521	COUNTRY	USA
ENCLOSED APPLICATION PARTS (Check all that apply)					
<input checked="" type="checkbox"/>	Application Data Sheet				Number of Pages: 3
<input checked="" type="checkbox"/>	Provisional Cover Sheet				Number of Pages: 1
<input checked="" type="checkbox"/>	Specification				Number of Pages: 16
<input checked="" type="checkbox"/>	Drawing(s)				Number of Sheets: 11
Photographs					
<input checked="" type="checkbox"/>	Small Entity Status				Number of Pages: 1
<input checked="" type="checkbox"/>	Power of Attorney				Number of Pages: 1
<input checked="" type="checkbox"/>	a list of references to be incorporated by reference and copies of those references				Number of Pages: 2
<input checked="" type="checkbox"/>	Assignment of Patent Rights and recordation cover sheet				Number of Pages: 5
<input checked="" type="checkbox"/>	Letter of Transmittal				Number of Pages: 2
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METHOD OF PAYMENT (check one)					
<input checked="" type="checkbox"/>	A check or money order is enclosed to cover the Provisional filing fees and the Assignment recordation fees				PROVISIONAL FILING FEE AND ASSIGNMENT RECORDATION FEE
<input type="checkbox"/>	The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number: _____				AMOUNT (\$ 120.00)

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

No

Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,
SIGNATURE 

Alfred K. Wiedmann Jr., PTO Registration No.: 48,033

DATE:

14 January 2007

PROVISIONAL APPLICATION FILING ONLY

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CERTIFICATE OF EXPRESS MAILING

I, Cheryl A. Swanson, hereby certify to the truth of the following items:

1. I am an employee of Santangelo Law Offices, P.C., 125 South Howes, Third Floor,
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2. I have this day deposited the attached Statement Establishing Small Entity Status
(Small Business) with the United States Postal Service as "Express Mail" for mailing to: Mail Stop
Provisional Application, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

Dated this 14 day of January 2004.

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01404
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Fort Collins, Colorado 80521.

2. I have this day deposited the attached Specification for "Instrument Support
Apparatus Having Non-Horizontal Tiers and Vertical Axis Pivot Capability" consisting of 16 pages
and Drawings consisting of 11 sheets with the United States Postal Service as "Express Mail" for
mailing to: Mail Stop Provisional Application, Commissioner for Patents, P.O. Box 1450,
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Cheryl A. Swanson
Cheryl A. Swanson

INSTRUMENT SUPPORT APPARATUS HAVING NON-HORIZONTAL TIERS AND VERTICAL AXIS PIVOT CAPABILITY

5 BACKGROUND OF THE INVENTION

Generally, the inventive technology disclosed herein relates to a novel and useful stand for the support of musical or other instruments, such as those that might be found as part of a drum set. More specifically, the inventive technology involves instrument stands which use leg members having a lower and upper end to support a singularity or multiplicity of rails or tiers to which instruments can be attached, where at least a portion of one of these tiers is higher in elevation than the remaining portion of that tier, and where certain leg supports (e.g., the front legs) are substantially vertical so as to provide optimal support.

Prior art stands typically utilized a one or more horizontal tiers. It should be understood that the term horizontal is intended to characterize not only straight tiers, but also curved tiers that curve within a horizontal plane. When a circumstance required the support of multiple instruments, as in the case of a drum set, a roughly semicircular array of multiple, substantially end-to-end tiers was typically utilized. Sometimes each of these multiple tiers was independently supported by its own leg members, but more typically all tiers were supported by shared vertical leg members, or a combination of shared vertical leg members and independent vertical leg members. Indeed, in some prior art, the inner end of an outer tier and the outer end of an inner or center tier might be attached to the same vertical leg.

Prior art discloses tiers that are joined to the legs at right angles, so that if the legs are vertical the tier axes are also horizontal (whether the tier is straight or curved). Typically, prior art stands have multiple tiers that are straight and/or curved and that are disposed in an arced horizontal array (e.g., a roughly semicircular horizontal array) about the user's position to improve user access to the instruments (e.g., to improve a drummer's access to drum set instruments). Prior art discloses attachments to fasten each individual instrument to a tier.

Sometimes it is appropriate to position all instruments at substantially the same height, but more often tradition or practicality requires placement of several instruments at varying heights above the supporting base (e.g., a floor). Most specifically in the case of drum instruments, it is traditional as well as practically desirable to place or establish the

5 instruments so that they collectively describe first a rising sweep from left to center left and then smoothly transitioning or arching at center to a falling sweep from center right to right, allowing the user to play ascending and descending percussion patterns with ease (of course, the terms center, left and right are with respect to a user of the instruments (e.g., a drummer), where center could be essentially that position that the user would face in assuming a

10 position in preparation to use all the instruments. Other preferred placements of instruments might call for a variation or even a reversal of this sweep of instruments or might require a more abrupt change from a rising to a falling tier axis.

Because the tiers of prior art stand designs do not have a rising or falling axis, an

15 individual tier could only provide one attachment height, even in cases where it must properly support instruments in a rising and/or falling swept array. Each individual tier of a multiple-horizontally-arrayed-tier stand might be separately placed at a height near the average required instrument height for that tier, but this will only very roughly approximate the optimum smooth rise and/or fall of an ideal instrument array. To compensate for this

20 shortcoming, height-adjustable riser elements may be incorporated within the instrument attachment means to enable placement of each individual instrument at its appropriate height above or below the tier height. The more a riser element is extended above or below the tier, the less structurally rigid it is; and when a stand supports many instruments by way of substantially extended riser elements, mechanical oscillations amplified by the length and/or

25 moment arm length and/or beam deflection of the substantially extended riser elements become a serious obstacle to precise playing, especially if the instruments are drums or electronic drum sensors which must be struck forcefully and rhythmically, thus initiating the oscillations. Additionally, riser elements that are elongated enough to provide the necessary extension are more costly to manufacture.

risers attendant horizontal tier instrument supports of the prior art was a primary impetus for at least one embodiment of the inventive technology disclosed herein. Thus, a more ideal arrayed-tier instrument stand would have off-horizontal tiers that much more closely approximate the ideal horizontally semicircularly sweeping and vertically rising and falling

5 axis defined by a properly placed array of instruments, making possible the use of shorter, stiffer and less expensive riser elements, or possibly eliminating the need for riser elements altogether.

Another desirable function or attribute or characteristic of semicircularly-arrayed

10 multi-tiered instrument stands is the ability to be adjusted for radial distance from the user. Since the stand partially surrounds the user, merely moving the stand closer to or farther away from the user in a single direction will result in an off-center user position which is detrimental to good instrument access in other directions. Thus it is important that the radius of the arc approximated by the tier array (as projected on a horizontal plane) be radially

15 adjustable, typically by moving the outer legs and outer tier ends horizontally toward or away from each other, pivoting the inner ends of the outer tiers about vertical axes near to or coincident with the vertical axes of the legs to which they are attached. In this way all supported instruments can be adjusted toward or away from the central user by substantially the same distance. Additionally, a situation such as, for example, the commonly practiced

20 placement of larger instruments to one side of the user and smaller instruments to the other side of the user might require that the tier array more closely approximate (again, in its projection onto a horizontal plane) a segment of a spiral of expanding radius in order to maintain a more constant distance between the user and the supported instruments. Such a use would require that the relative horizontal angle of an outer tier to its adjacent inner tier be

25 different for the left outer tier than for the right outer tier.

In providing or establishing pivot axes for radial or spiral horizontal tier array adjustment, it is important to consider the effects of nonverticality of the pivot axes. If such a pivot axis is not vertical, the outer tier end, while being adjusted, does not move in a

30 horizontal arc, and thus its height changes simultaneously as its angular position is changed. This in turn raises or lowers the leg to which the outer end of the tier under adjustment is

attached.. If the total number of legs is greater than three, this height change will result in a detrimental condition of noncoplanarity of the several legs' lower ends (feet), that is, they will no longer all contact the floor and will require significant additional adjustments to bring all feet back into contact with the floor; additionally, this height change and/or the secondary 5 adjustments needed to compensate for it can result in unintentional vertical tilting of the tier array (e.g., tilting in towards or out from a drummer seated in the center of the array), which requires yet more adjustment to correct.

It should be pointed out that the establishment of a tier pivot axis that is nonvertical 10 (and/or nonparallel with the corresponding leg) can in fact be intentionally done to create a desired tilt of the horizontal, prior art tier array (an instance of such intentional reconfiguration will be discussed more thoroughly below); of course, however, attendant such a practice are the foot noncoplanarity problems explained above. So it is clear that for the purpose of avoiding foot noncoplanarity-related complications and unintentional tier 15 array vertical tilt related complications when adjusting outer tier horizontal angles (and thus tier array horizontal radius), it is desirable to provide and maintain vertical pivot axes for the inner ends of outer tiers.

Occasionally, in recognition of the preferability or appropriateness or usefulness of an 20 off-horizontal rising and falling swept tier array, attempts have been made to achieve an analogous effect by collectively tilting the entire array of tiers to a nonhorizontal condition. This has sometimes been accomplished by making the progressively outward legs progressively shorter than the inner legs, all the while maintaining a right angle of pivotable joining between each inner leg and the tiers which attach to it. This method keeps the leg 25 axes, which are also in this case the tier end pivot axes, parallel to each other but makes them nonvertical, with the result that when the individual tier segments are rotated toward or away from the user (tier array horizontal angle or horizontal radius adjustment, where horizontal, as used in this context, refers to a horizontal projection of the actual arc defined by the tier array) the tier array vertical tilt angle might unintentionally change (e.g., towards or away 30 from the center positioned user of the instruments); and/or, if the stand had four or more legs, at least one leg might no longer reach the floor as has been previously discussed. Further,

where leg axes are also the tier end pivot axes, repositioning the tier array to a rising or falling orientation results in repositioning the pivot axis to an off-vertical orientation, which in turn results in an off-vertical front leg, and a resultant compromise of the support afforded by the front legs that were once in the preferred vertical orientation, but now are in a less supportive tilted orientation. Another method of tilting the array of curved tiers toward the user involved the moving of the legs to nonparallel relationships with each other while maintaining a right angle of joining between each inner leg and the tiers which attach to it. This method also results in the establishment of nonvertical tier pivot axes and thus possesses the same tier segment rotation adjustment complications as previously discussed (and, where leg axes are also the tier end pivot axes, a compromise in the support afforded by the legs, as discussed). For these reasons, it is clearly preferable to maintain leg verticality and/or tier pivot axis verticality while non- horizontally and non-vertically tilting or compound-curving a tier array.

Yet another desirable function or attribute or characteristic of instrument stands is the ability to pass signal cables or wires through an interior space within a tier, from one end of the tier to the other or from one end of a tier to a termination point or a point of ingress or egress at an intermediate location along the tier or tier span. In this way signal cables associated with supported instruments can be hidden from view for a significant portion of their length, improving the stand's appearance and reducing tangling and snagging of cables during use or transport. Given the use of a hollow tubular element as a tier, it is of course possible to create holes or ports in the tier sidewall at both ends of the tier, through which cables can pass. However, this practice requires a costly secondary operation to be performed at each end of the tier, and may require the use of a costly junction box or grommet or baffle to make the holes visually acceptable and/or noninjurious to the cables, and reduces the length of the portion of the tier to which instruments can be attached. Additionally, and more importantly, by removing load-carrying material from the tier, holes in the tier sidewalls create stress risers, compromising the tier's mechanical structure at the very locations at which it needs to be strongest: at the end joints.

30

One might also wish to consider the use of holes in the legs for passing cables out the

end opening of one tier and into the end opening of the next tier without exiting the stand structure. But a little thought shows the difficulty this practice would create with respect to tier horizontal angle adjustment or collapse for transport or vertical tier end height adjustment, as any of these would cause a shearing action between the tier end and edges of

5 the hole in the leg which could cause cables to be cut; and once again a structural member, in this case the leg, would have its strength and stiffness compromised by a major interruption in its load-bearing surface.

Yet another means of passing cables through a tubular tier is to use tier-to-leg
10 attachments that keep the tier end openings exposed so that cables can pass directly in or out the ends of the tiers. But this again provides challenges to visual acceptability because of the relatively large openings exposed to view, and/or creates unnecessary joint bulk and complexity by moving the tier axis out of the plane of the axis of the leg to which it abuts.

15 Yet another means of enabling the passing of cables into and out of the open ends of hollow support tiers might be to create a hole in an attachment that is used to fasten a tier end to a leg. In this way the cables can pass out the end of the tier into a hollow within the attachment element and thence out through the hole in the attachment element itself. Of course the hole in the attachment element will structurally weaken the attachment element,
20 and so the hole must be kept small to minimize the weakening. But it is difficult in practice to keep the hole small, because not only the cables themselves but preferably the preattached cable end terminations or connectors must pass into or out of the hole in the attachment element during the process of cable installation. These cable end connectors are typically much larger in diameter or bulkier than the cables themselves, or perhaps are noncoaxial with
25 the cable axis, and thus will not pass through a hole that is only slightly larger than the cable or cable bundle in use. Thus a more ideal and more useful tier end attachment element would provide a cable entry or exit hole that was only large enough to pass the required number of cables, and would be configured so that the cable end connectors need not pass through the holes during installation.

Fig. 1 shows an embodiment of the inventive technology having the non-horizontal tier feature.

5 Fig. 2 shows an embodiment of the inventive technology having the non-horizontal tier feature. It clearly shows vertical legs and non-horizontal, curved tiers, in addition to joiners that attach them.

10 Fig. 3 shows an embodiment of the inventive technology having the non-horizontal tier feature. It clearly shows vertical legs, side tiers, and joiners that attach the tiers to the legs.

Fig. 4 shows an embodiment of the inventive technology having the non-horizontal tier feature.

15 Fig. 5 shows an embodiment of the inventive technology having the non-horizontal tier feature. It clearly shows, in addition to vertical legs, side tiers, and joiners that attach the tiers to the legs, risers that are used to attach instruments to the tiers.

20 Fig. 6 shows an embodiment of the inventive technology having the non-horizontal tier feature. It clearly shows, in addition to four support legs, two side tiers, two front tiers (one above the other) and joiners that attach the tiers to the legs, risers that are used to attach instruments to the tiers.

25 Fig. 7 shows an embodiment of the inventive technology having the non-horizontal tier feature.

Fig. 8 shows an embodiment of the inventive technology having the non-horizontal tier feature.

30 Fig. 9 shows an embodiment of the inventive technology having the non-right angle tier-to-leg joiner, in addition to the cable carrying channel.

Fig. 10 shows an embodiment of the inventive technology having the non-right angle tier-to-leg joiner, in addition to the cable carrying channel (shown as the channel to the right of the leg surrounding channel).

5

Fig. 11 shows an embodiment of the inventive technology having the non-right angle tier-to-leg joiner, in addition to the cable carrying channel. It clearly shows cables passing through an end portion of a tier, with one cable traveling up through a half of the cable carrying channel and one passing down through a half of the cable carrying channel.

10

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As mentioned earlier, the present invention includes a variety of aspects, which may be combined in different ways. The following descriptions are provided to list elements and 15 describe some of the embodiments of the present invention. These elements are listed with initial embodiments, however it should be understood that they may be combined in any manner and in any number to create additional embodiments. The variously described examples and preferred embodiments should not be construed to limit the present invention to only the explicitly described systems, techniques, and applications. Further, this 20 description should further be understood to support and encompass descriptions and claims of all the various embodiments, systems, techniques, methods, devices, and applications with any number of the disclosed elements, with each element alone, and also with any and all various permutations and combinations of all elements in this or any subsequent application.

25 At least one embodiment of the invention may comprise at least one nonhorizontal and nonvertical straight tier element and/or at least one substantially nonhorizontally curved tier element; said tier element having a first and second end; said tier element supported substantially at each of its ends at a distance from a base supporting surface by a leg element; the leg element having an upper end to which the tier ends are pivotably attached, 30 the axis of pivoting being vertical, and a lower end resting on the base supporting surface such as the ground, a floor, a drum riser, etc.

At least one embodiment of the inventive technology is an instrument support rack that may comprise a plurality of tiers (each of which may be straight or curved), at least one of which has a portion that, in an installed configuration, is at an elevation that is different
5 from the elevation of a remaining portion of the tier, and where this instrument support rack has at least two tiers that are pivotally coupled so that one of the tiers is rotatable about the other in a substantially vertical axis.

At least one embodiment of the inventive technology is an instrument support rack
10 (e.g., a drum set instrument support rack) that may comprise at least one side tier that has a front leg point of attachment that is higher than that side tier's point of attachment to the a rear leg, while the side tier is rotatable at the point of attachment about a vertical axis.

The above described inventive technology embodiments avoids the aforementioned
15 undesirable side effects of tilting the tier array toward the user by pivotably joining each tier to its adjacent legs at a nonright angle (or in a non-perpendicular relation), thereby allowing for the use of shorter, stiffer and less expensive riser elements (or possibly allowing for the elimination of the need for riser elements altogether) while maintaining both verticality (and perhaps parallelness) of all pivot axes or at least all inner (or non-outermost) pivot axes (and
20 thus precluding the aforementioned problems attendant non-vertical pivot axes.)

To join the tier ends to the legs at a fixed nonright angle, another aspect of the invention finds application. In a preferred embodiment of the inventive technology uses a rigid or semirigid nonright angle joiner element to join tier ends to the legs at a fixed
25 nonright angle. The joiner element might further comprise substantially symmetrical or nonsymmetrical joiner halves. The joiner element might further comprise vertical axis pivot means or element. The vertical pivot means or element might further comprise a defeatable (or releasable) frictional clamp of a cylindrical bore of the joiner around a vertical cylindrical leg element. The vertical pivot means or element might further comprise a multiplicity of
30 fastener means acting between joiner elements or halves to forcibly clamp the joiner element about the leg member and tier end. In a preferred embodiment of the inventive technology

the non-right angle joiner element finds application in attaching tiers of a drum set instrument support array or rack, but other applications are envisioned by the inventor.

In a preferred embodiment, a fully or partially curved center tier segment may be

- 5 pivotably joined to its adjacent supporting legs at properly selected and equal or inversely equal nonright angles, and the plane of the tier curve thus becomes nonhorizontal. That is, if the angles of joining of the curved tier's ends to the adjacent vertical legs are equal and deviate from 90 degrees by an amount greater than zero and less than one half of the arc angle of the curved tier, then from a first end the tier curves both upward (or downward) and
- 10 outward to center span, and then back downward (or upward) and inward to a second end, the second end being substantially the same height as the first. Alternately, when a curved tier (e.g., a side tier) is joined to its adjoining vertical legs at equal but inverse angles, such as for example +5 degrees and -5 degrees (of deviation from 90 degrees), the tier's plane of curvature becomes nonhorizontal and the first and second tier ends are at different heights.
- 15 In a similar fashion, when a straight tier is joined to its adjoining legs at equal but inverse angles, such as for example +5 degrees and -5 degrees, the tier's axis becomes nonhorizontal and the first and second tier ends are at different heights. By reversing the joining angles at each tier end the direction of tier rise is also reversed. By combining same-angle, inverse-angle, and reversed inverse-angle tier segments with legs, the tier ends being pivotably
- 20 joined to the legs with the pivot axes being vertical, and the legs being shared by adjacent tiers where applicable, a stand can be created that very closely approximates an ideal compound curve as described above, while avoiding the undesirable adjustment complications that arise from nonvertical pivot axes.

25 At least one embodiment of the inventive technology may comprise a joiner element (which may be rigid or semi-rigid) that incorporates an interim space located between an end opening of a hollow joined tier and a joined leg member and/or pivot means, the interim space communicating with the joiner element exterior by way of a hole or port. Said joiner element may incorporate the interim space and the hole might further comprise a pair of

- 30 symmetrical or nonsymmetrical joiner halves. The joiner element may incorporate the interim space and the hole and the joiner halves might further comprise a joint or seam or

narrow split between assembled joiner halves, with the interim space and the hole perhaps comprising widenings of one or both sides of the seam such that the interim space and the perimeter of the hole are breached when the halves of the joiner element are separated; possibly further comprising a multiplicity of holes formed by widenings of the said seam or

5 narrow split .

At least one embodiment of the invention may comprise a tier to leg joiner that provides for a plane of egress of cables into an open end of the tier that is internal of the joiner, where the tier to leg joiner comprises a channel capable of carrying or surrounding 10 cable(s) so that the carried cables rotate with the tier about the leg when such rotation is induced, and where the cable carrying channel is separable upon installation of the cables so that the position of the cables in the channel established at the time of installation can be substantially the same as their intended position during operation of the device(s) (e.g., an electronic drum) that they provide electrical current for (thus eliminating the need for 15 extensive cable pull through that necessitates pull-through of bulky cable end connectors. In a preferred embodiment, the cable carrying channel visually conceals the egress of cables into the open end of the tier. In a preferred embodiment, the cable carrying channel comprises two open ends (one at the top of the joiner as installed, and one at the bottom), but does not have channel side-walls where the joined tier's open end is most proximate the 20 channel.

In the above described embodiment of my invention, a cable or bundle of cables with terminations preattached can be passed through the relatively large hollow inside a tier element and out either or both open ends of the tier element prior to assembly of the tier ends 25 to the joiner element. A single half of the joiner element can then be placed against or assembled to the tier end and the cable bundle laid in the trough or groove or channel formed by the breached interim space and hole. The other clamp half can then be added to the assembly, thus closing the breach and enclosing the cable or cable bundle with the terminated ends outside the joiner element. In this way, the cable entrance/exit hole need only be as 30 large as the cable bundle, as the joiner element halves combine to encircle the cable or cable bundle, rather than requiring the bulky cable terminations to pass through an already-closed

hole.

It is important to understand that aspects of the invention may be combined. For example, the non-right angle tier-to-leg joiner may be combined with either (or both of) the cable carrying channel or the non-horizontal tiering feature. Similarly, the non-horizontal tiering feature may be combined with either (or both of) the non-right angle tier-to-leg joiner feature or the cable carrying feature. Indeed, any combinations or permutations of any of the non-horizontal tiering feature, the non-right angle tier-to-leg joiner, and/or the cable carrying channel feature.

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As can be easily understood from the foregoing, the basic concepts of the present invention may be embodied in a variety of ways. It involves (but is not limited to) both support and attachment techniques as well as devices to accomplish the appropriate support or attachment. In this application, the support or attachment techniques are disclosed as part 15 of the results shown to be achieved by the various devices described and as steps which are inherent to utilization. They are simply the natural result of utilizing the devices as intended and described. In addition, while some devices are disclosed, it should be understood that these not only accomplish certain methods but also can be varied in a number of ways. Importantly, as to all of the foregoing, all of these facets should be understood to be 20 encompassed by this disclosure.

The discussion included in this provisional application is intended to serve as a basic description. The reader should be aware that the specific discussion may not explicitly describe all embodiments possible; many alternatives are implicit. It also may not fully 25 explain the generic nature of the invention and may not explicitly show how each feature or element can actually be representative of a broader function or of a great variety of alternative or equivalent elements. Again, these are implicitly included in this disclosure. Where the invention is described in device-oriented terminology, each element of the device implicitly performs a function. Apparatus claims may not only be included for the device 30 described, but also method or process claims may be included to address the functions the invention and each element performs. Neither the description nor the terminology is

intended to limit the scope of the claims that will be included in any subsequent patent application.

It should also be understood that a variety of changes may be made without departing
5 from the essence of the invention. Such changes are also implicitly included in the description. They still fall within the scope of this invention. A broad disclosure encompassing both the explicit embodiment(s) shown, the great variety of implicit alternative embodiments, and the broad methods or processes and the like are encompassed by this disclosure and may be relied upon when drafting the claims for any subsequent patent
10 application. It should be understood that such language changes and broader or more detailed claiming may be accomplished at a later date (such as by any required deadline) or in the event the applicant subsequently seeks a patent filing based on this filing. With this understanding, the reader should be aware that this disclosure is to be understood to support any subsequently filed patent application that may seek examination of as broad a base of
15 claims as deemed within the applicant's right and may be designed to yield a patent covering numerous aspects of the invention both independently and as an overall system.

Further, each of the various elements of the invention and claims may also be achieved in a variety of manners. Additionally, when used, the term "element" is to be
20 understood as encompassing individual as well as plural structures that may or may not be physically connected. This disclosure should be understood to encompass each such variation, be it a variation of an embodiment of any apparatus embodiment, a method or process embodiment, or even merely a variation of any element of these. Particularly, it should be understood that as the disclosure relates to elements of the invention, the words for
25 each element may be expressed by equivalent apparatus terms or method terms -- even if only the function or result is the same. Such equivalent, broader, or even more generic terms should be considered to be encompassed in the description of each element or action. Such terms can be substituted where desired to make explicit the implicitly broad coverage to which this invention is entitled. As but one example, it should be understood that all actions
30 may be expressed as a means for taking that action or as an element which causes that action. Similarly, each physical element disclosed should be understood to encompass a disclosure

of the action which that physical element facilitates. Regarding this last aspect, as but one example, the disclosure of a "support" should be understood to encompass disclosure of the act of "supporting" -- whether explicitly discussed or not -- and, conversely, were there effectively disclosure of the act of "supporting", such a disclosure should be understood to encompass disclosure of a "support" and even a "means for supporting". Such changes and alternative terms are to be understood to be explicitly included in the description.

Any acts of law, statutes, regulations, or rules mentioned in this application for patent; or patents, publications, or other references mentioned in this provisional application for patent are hereby incorporated by reference. In addition, as to each term used it should be understood that unless its utilization in this application is inconsistent with such interpretation, common dictionary definitions should be understood as incorporated for each term and all definitions, alternative terms, and synonyms such as contained in the Random House Webster's Unabridged Dictionary, second edition are hereby incorporated by reference. Finally, all references listed in the list of References To Be Incorporated By Reference In Accordance With The Provisional Patent Application or other information statement filed with the application are hereby appended and hereby incorporated by reference, however, as to each of the above, to the extent that such information or statements incorporated by reference might be considered inconsistent with the patenting of this/these invention(s) such statements are expressly not to be considered as made by the applicant(s).

Thus, the applicant(s) should be understood to have support to claim and make a statement of invention to at least: i) each of the devices (including support and attachment devices) as herein disclosed and described, ii) the related methods disclosed and described, iii) similar, equivalent, and even implicit variations of each of these devices and methods, iv) those alternative designs which accomplish each of the functions shown as are disclosed and described, v) those alternative designs and methods which accomplish each of the functions shown as are implicit to accomplish that which is disclosed and described, vi) each feature, component, and step shown as separate and independent inventions, vii) the applications enhanced by the various systems or components disclosed, viii) the resulting products

produced by such systems or components, ix) each system, method, and element shown or described as now applied to any specific field or devices mentioned, x) methods and apparatuses substantially as described hereinbefore and with reference to any of the accompanying examples, xi) the various combinations and permutations of each of the 5 elements disclosed, and xii) each potentially dependent claim or concept as a dependency on each and every one of the independent claims or concepts presented.

With regard to claims whether now or later presented for examination, it should be understood that for practical reasons and so as to avoid great expansion of the examination 10 burden, the applicant may at any time present only initial claims or perhaps only initial claims with only initial dependencies. Support should be understood to exist to the degree required under new matter laws -- including but not limited to European Patent Convention Article 123(2) and United States Patent Law 35 USC 132 or other such laws-- to permit the addition of any of the various dependencies or other elements presented under one 15 independent claim or concept as dependencies or elements under any other independent claim or concept. In drafting any claims at any time whether in this application or in any subsequent application, it should also be understood that the applicant has intended to capture as full and broad a scope of coverage as legally available. To the extent that insubstantial substitutes are made, to the extent that the applicant did not in fact draft any claim so as to 20 literally encompass any particular embodiment, and to the extent otherwise applicable, the applicant should not be understood to have in any way intended to or actually relinquished such coverage as the applicant simply may not have been able to anticipate all eventualities; one skilled in the art, should not be reasonably expected to have drafted a claim that would have literally encompassed such alternative embodiments.

25

Further, if or when used, the use of the transitional phrase "comprising" is used to maintain the "open-end" claims herein, according to traditional claim interpretation. Thus, unless the context requires otherwise, it should be understood that the term "comprise" or variations such as "comprises" or "comprising", are intended to imply the inclusion of a 30 stated element or step or group of elements or steps but not the exclusion of any other

element or step or group of elements or steps. Such terms should be interpreted in their most expansive form so as to afford the applicant the broadest coverage legally permissible.

Finally, any claims set forth at any time are hereby incorporated by reference as part 5 of this description of the invention, and the applicant expressly reserves the right to use all of or a portion of such incorporated content of such claims as additional description to support any of or all of the claims or any element or component thereof, and the applicant further expressly reserves the right to move any portion of or all of the incorporated content of such claims or any element or component thereof from the description into the claims or vice- 10 versa as necessary to define the matter for which protection is sought by this application or by any subsequent continuation, division, or continuation-in-part application thereof, or to obtain any benefit of, reduction in fees pursuant to, or to comply with the patent laws, rules, or regulations of any country or treaty, and such content incorporated by reference shall survive during the entire pendency of this application including any subsequent continuation, 15 division, or continuation-in-part application thereof or any reissue or extension thereon.

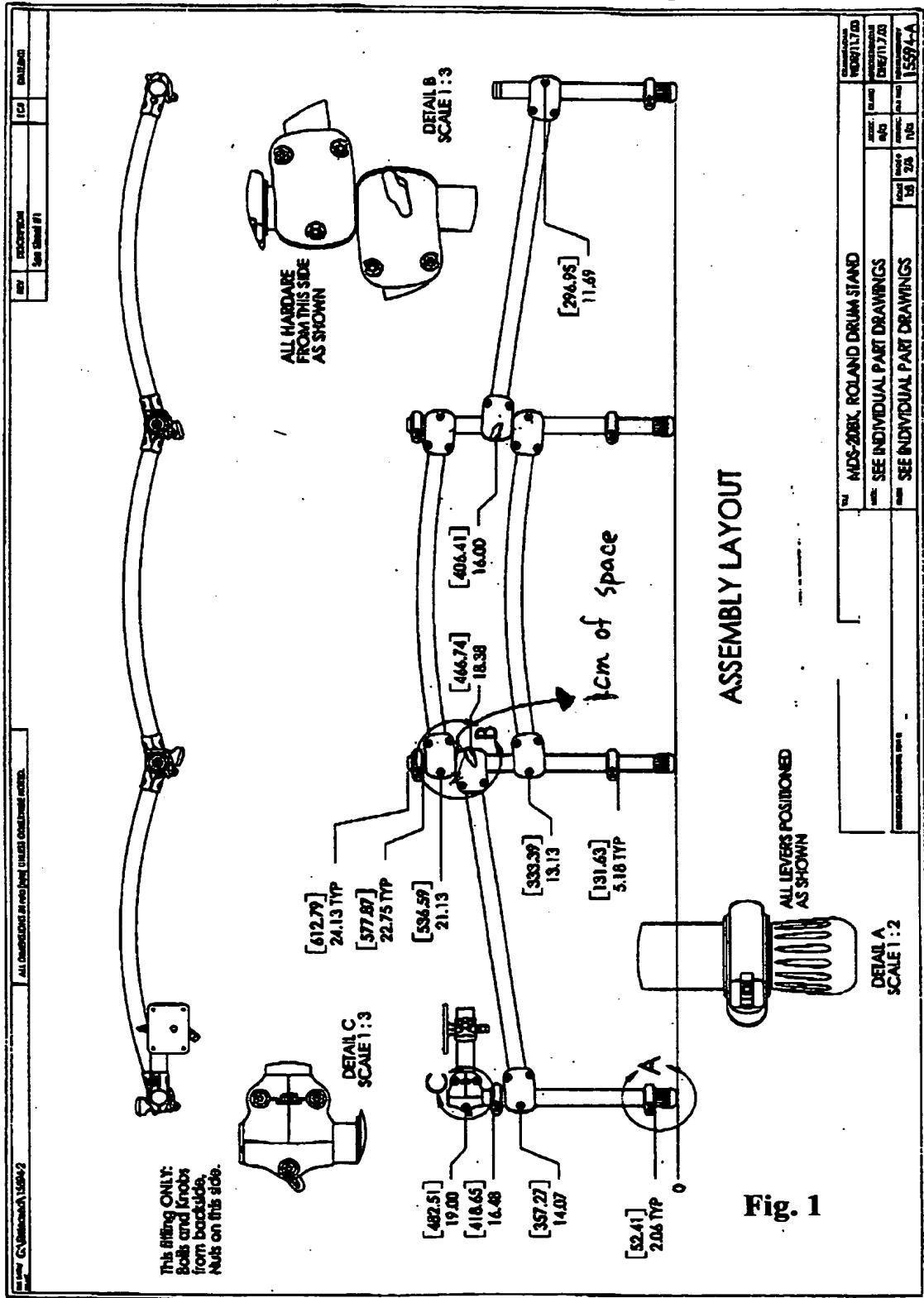
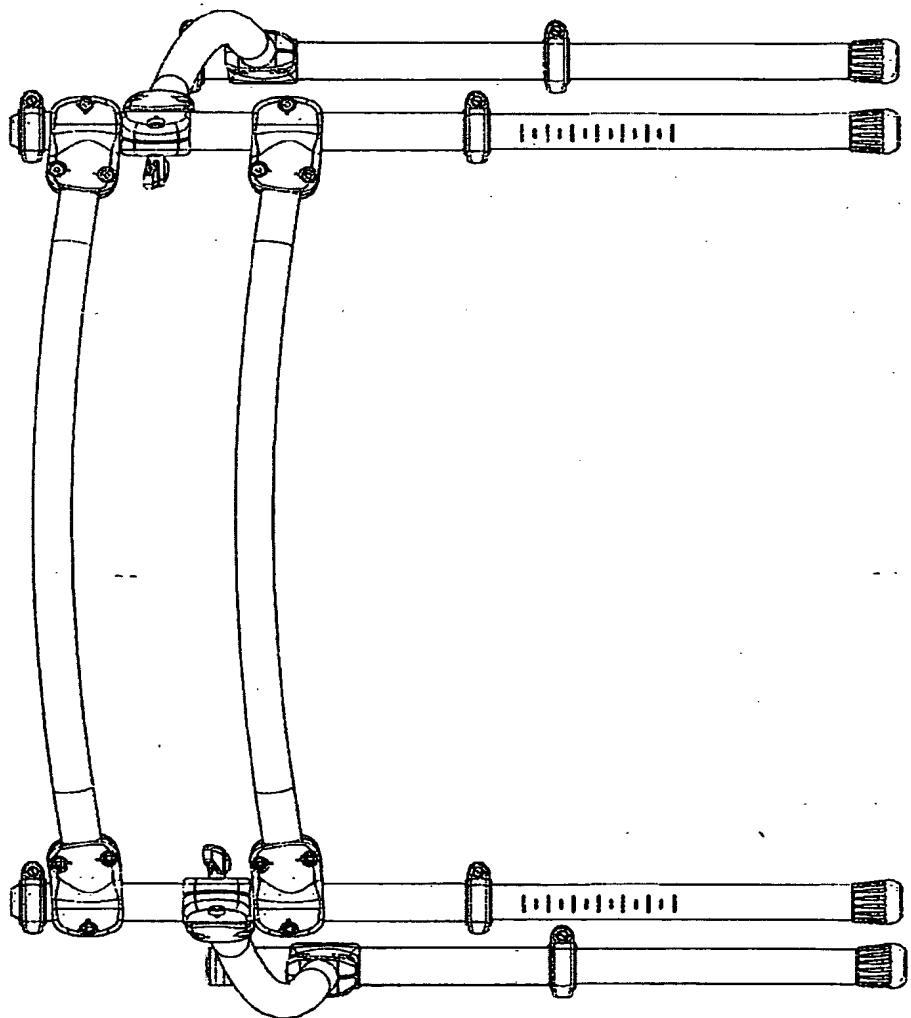


Fig. 2



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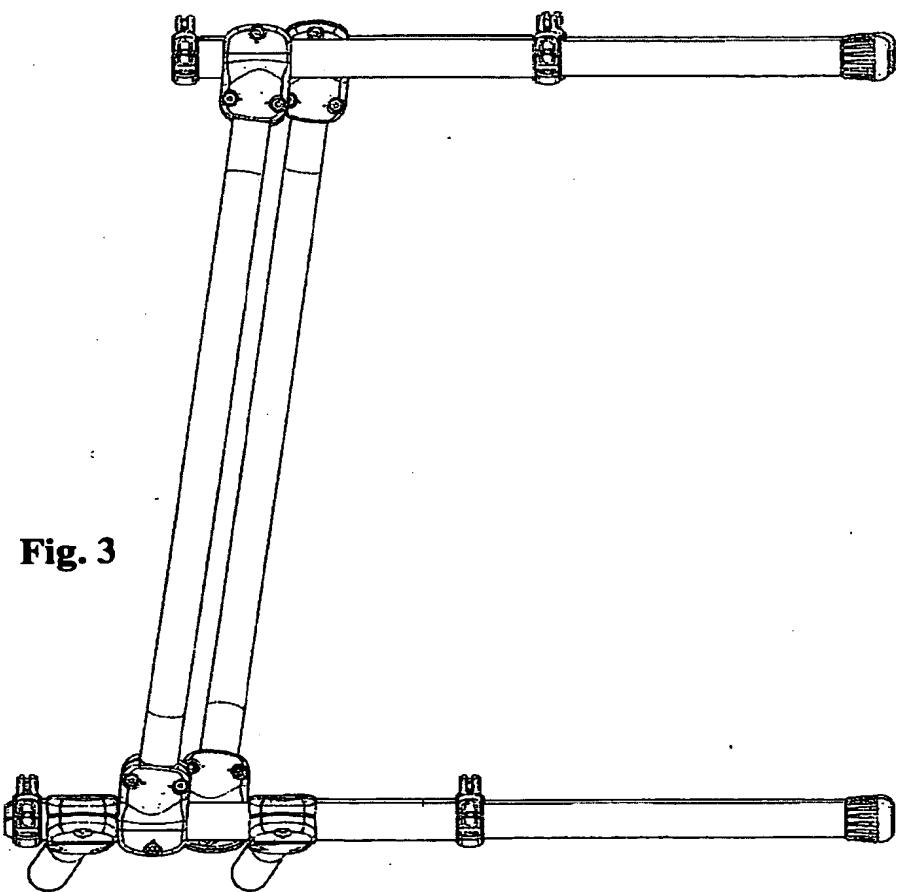


Fig. 3

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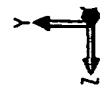
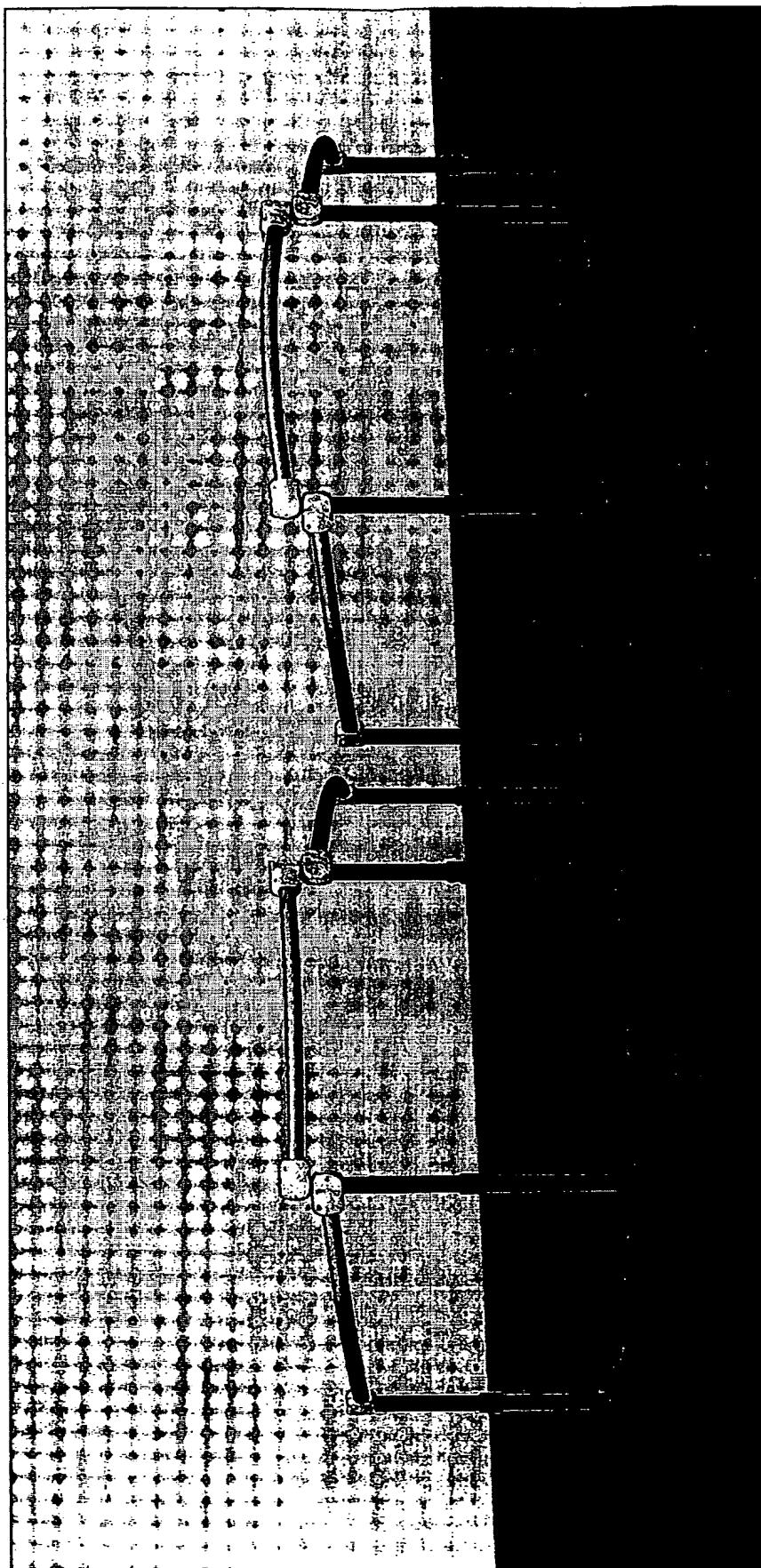


Fig. 4



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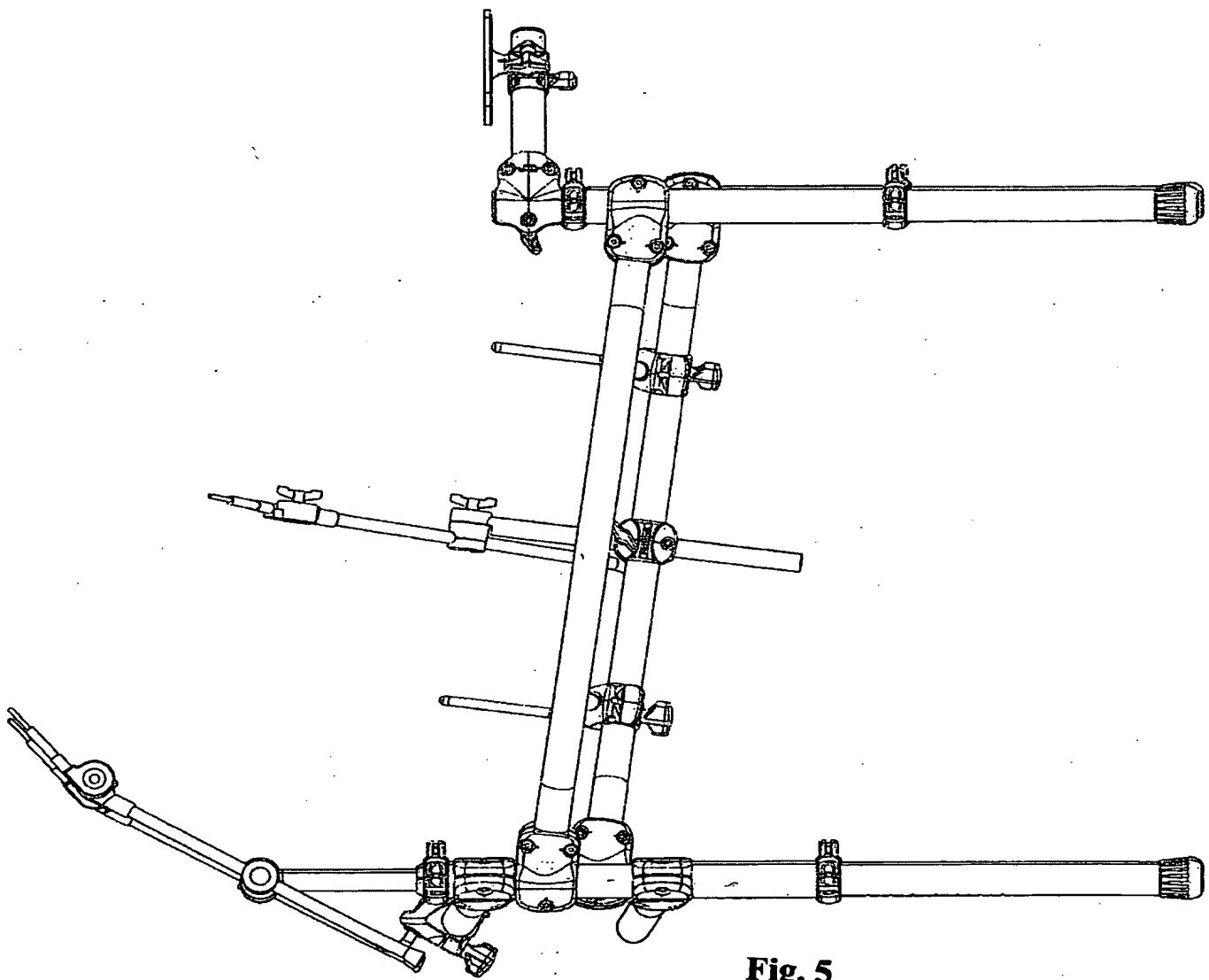
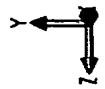


Fig. 5

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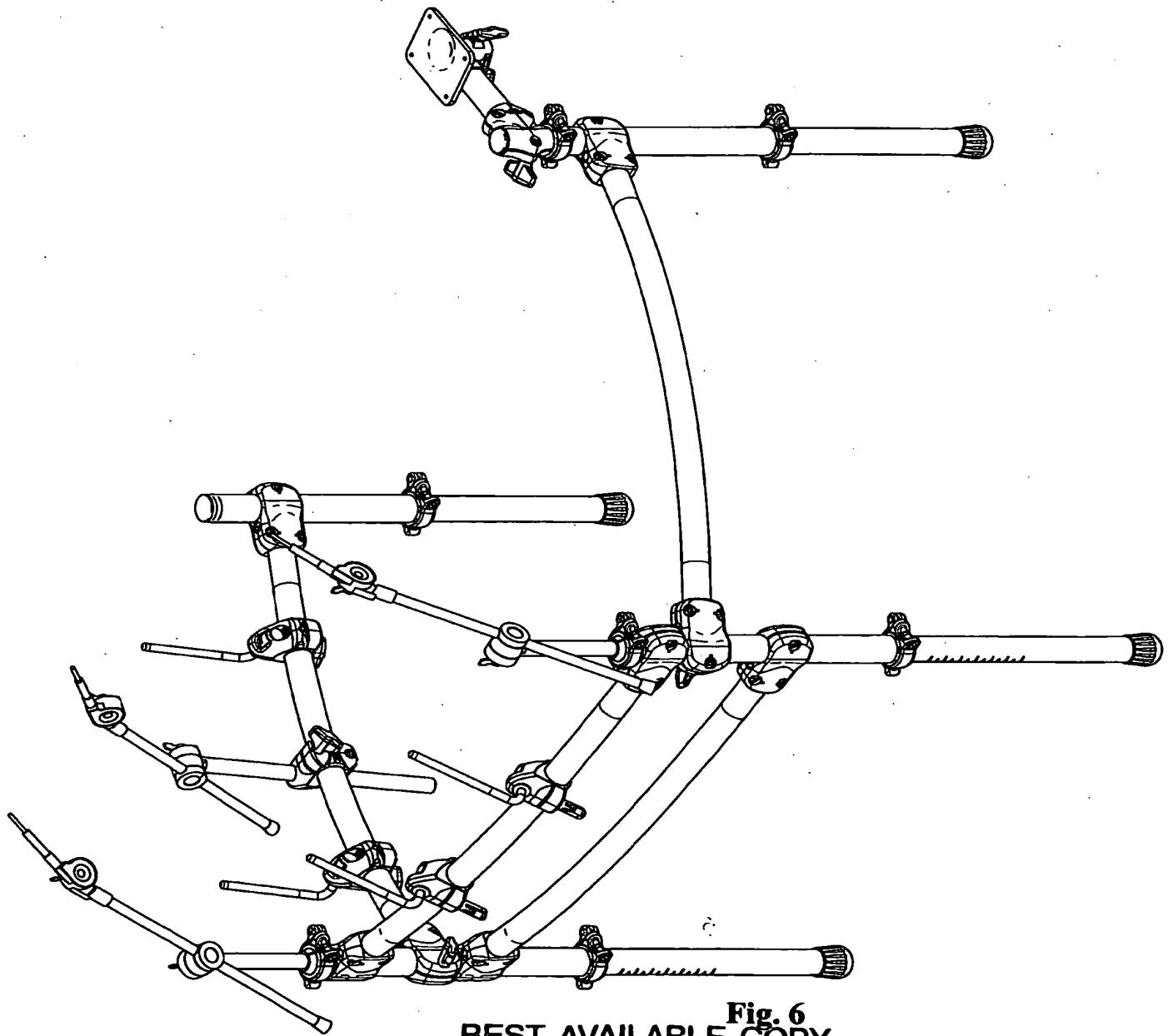


Fig. 6
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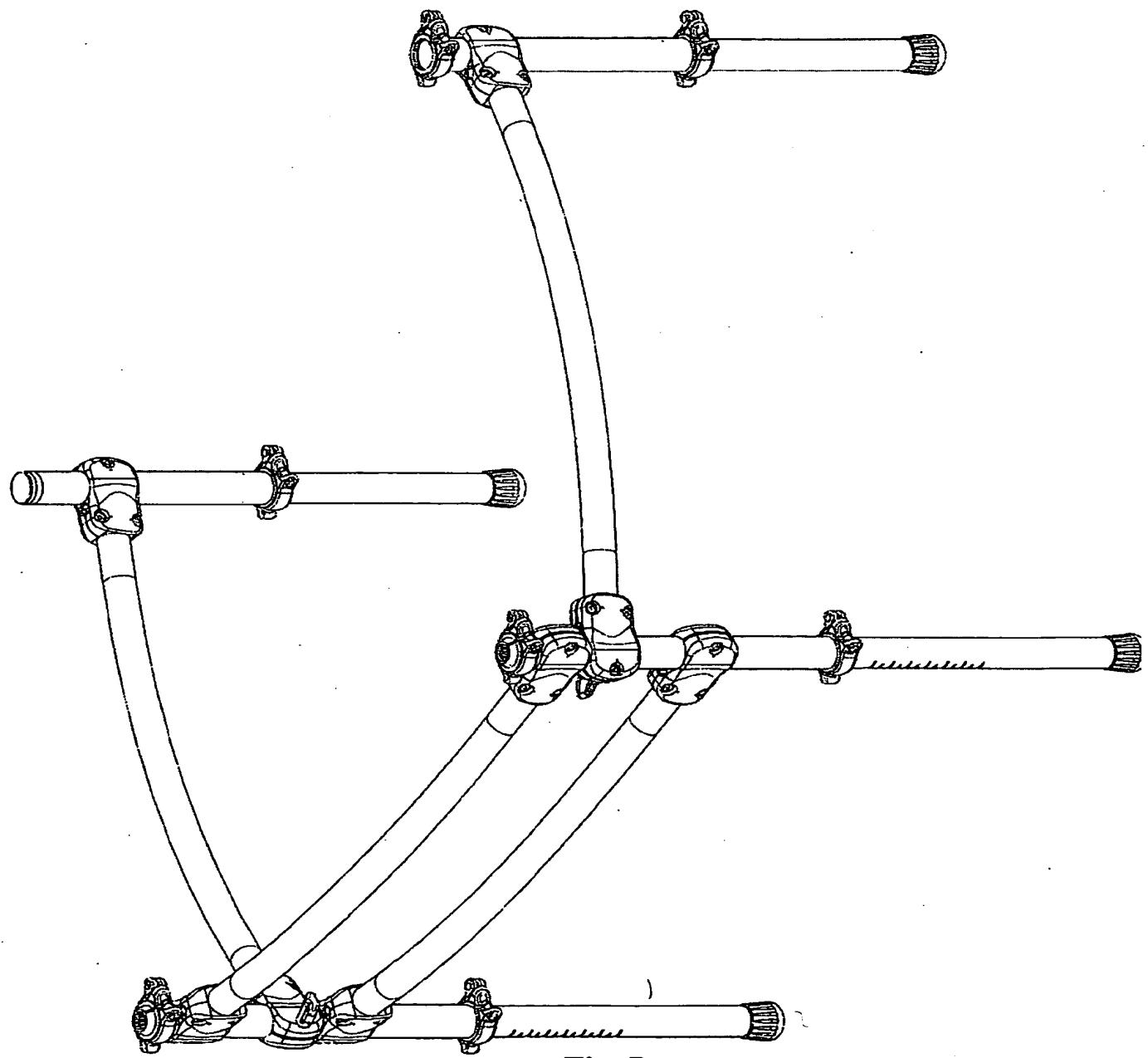


Fig. 7

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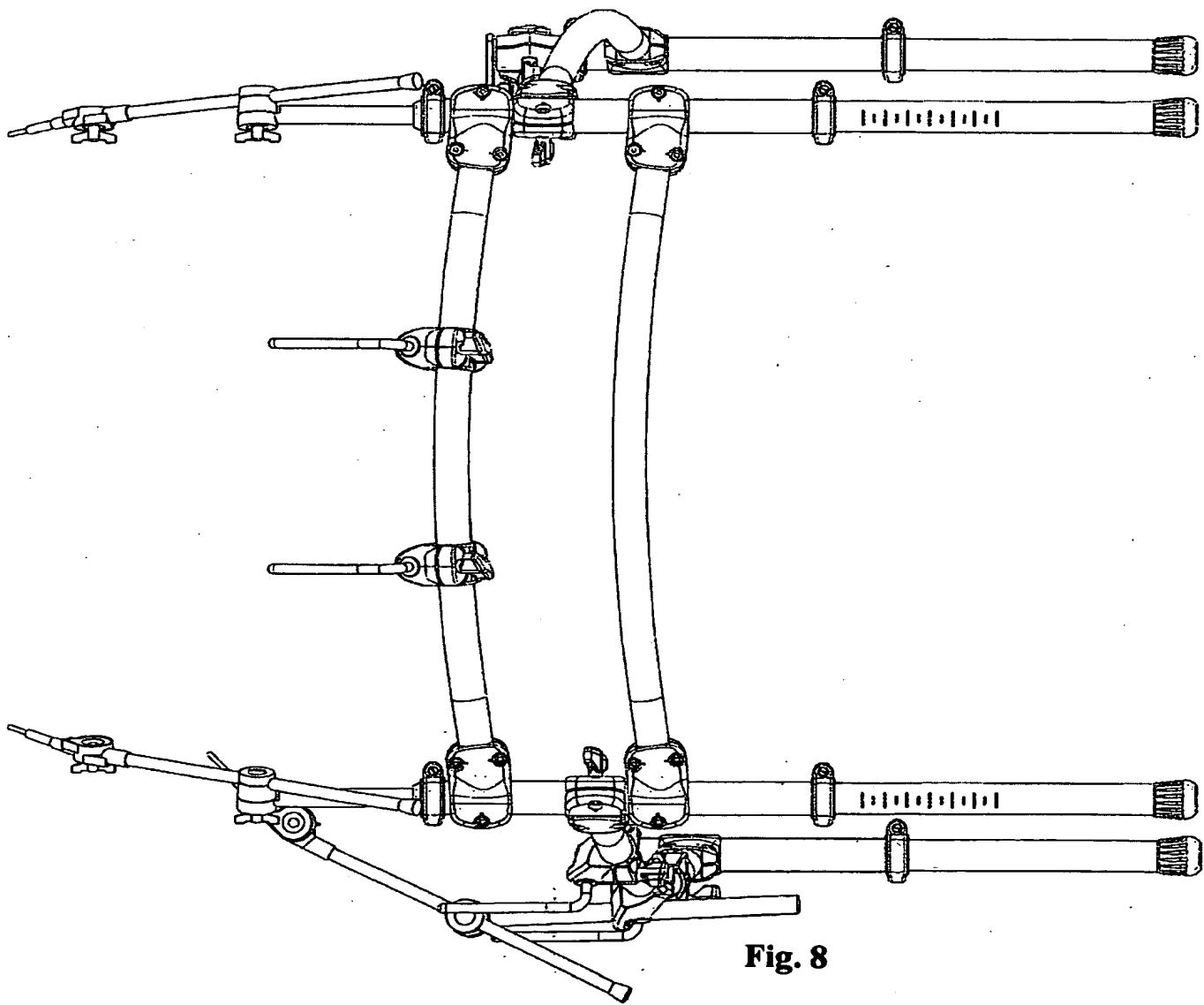


Fig. 8

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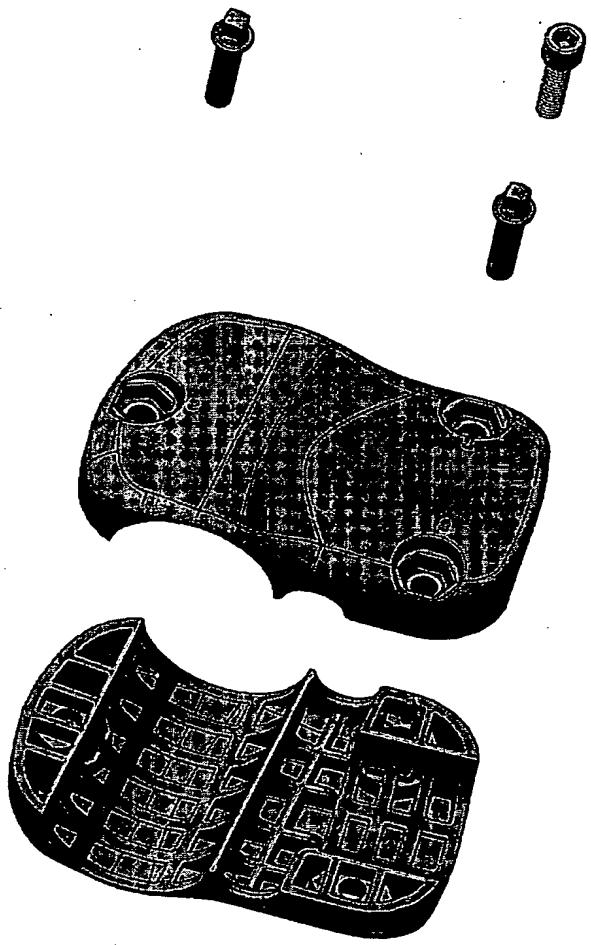


Fig. 9



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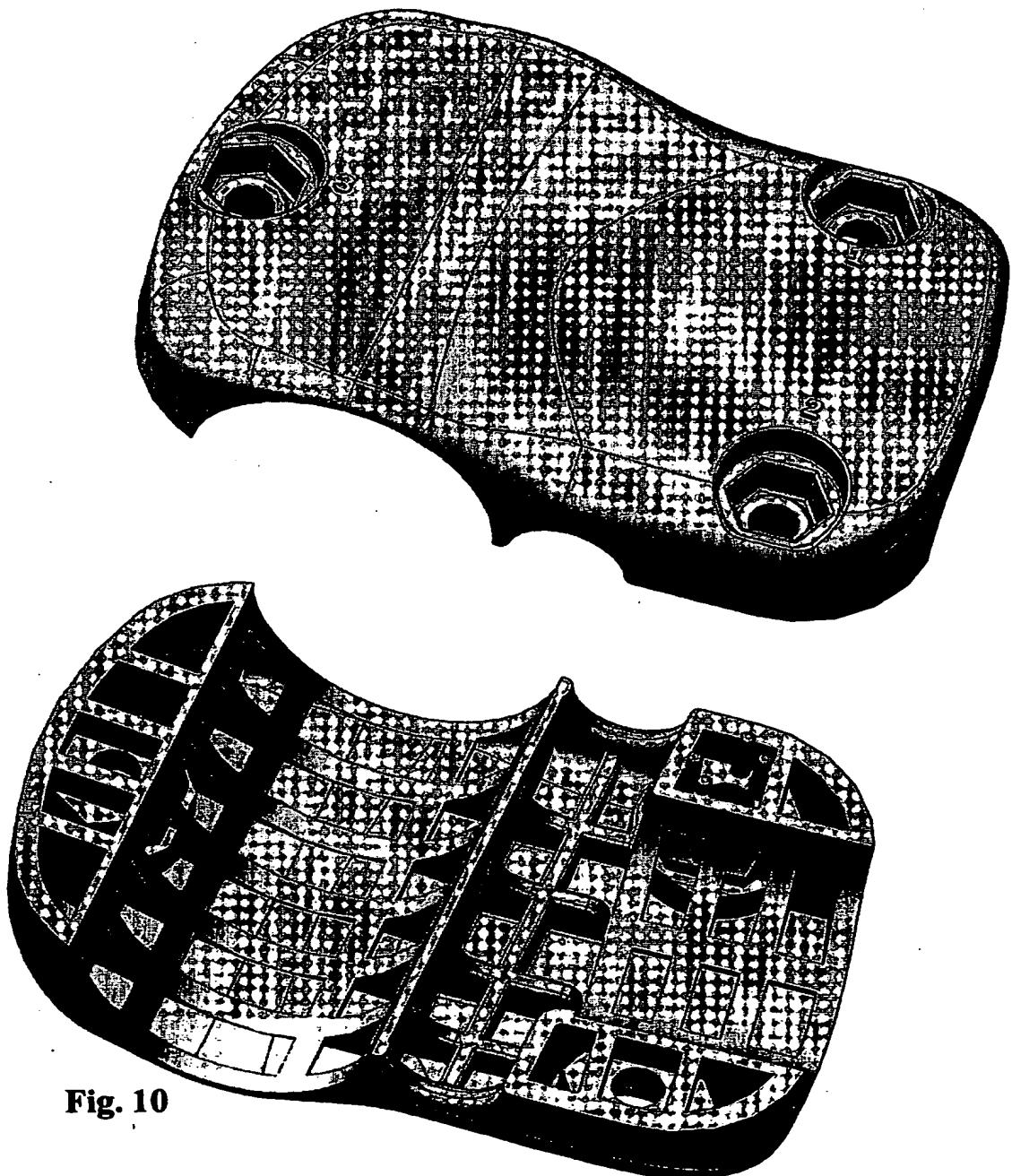


Fig. 10

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